

### **REMARKS**

In view of the foregoing amendments and the following remarks, Applicants respectfully request reexamination of the present application. Claim 116 has been amended, Claim 122 has been cancelled and new Claims 123-129 have been added.

### **Claim Rejections**

The Examiner has rejected Claims 116 and 118-121 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,413,736 by Nishisu et al. The Examiner states that Nishisu et al. disclose substantially spherical, europium doped  $Y_2O_3$  particles having an average particle size of 0.1 to 0.18 microns, where more than 99% of the particles have a size within the range of  $D \pm 0.05$  microns (where D is the average particle size). The Examiner states that the size distribution and the average size fall within the claimed ranges and that these particles are known in the art to be single crystals, and thus have a crystallite size that falls within the claimed range.

The Examiner has also rejected Claims 116 and 118-122 under 35 U.S.C. § 103(a) as being unpatentable over Nishisu et al. The Examiner states that the size distribution disclosed by Nishisu et al. falls within the claimed ranges and that the average particle size range overlaps the claimed range. The Examiner states that product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim*, 191 USPQ 90 (CCPA 1976); *In re Malagari*, 182 USPQ 549 (CCPA 1974); *In re Fields*, 134 USPQ 242 (CCPA 1962); *In re Nehrenberg*, 126 USPQ 383 (CCPA 1960). The Examiner also states that these particles are known in the art to be single crystals and thus have a crystallite size that falls within the claimed range. The Examiner also states that the taught precipitation and calcination process is known to produce high purity particles and one of ordinary skill in the art would expect this resulting high purity to overlap the claimed range, absent any showing to the contrary.

In view of the foregoing amendments and the following remarks, Applicants respectfully traverse this rejection.

Applicants have amended independent Claim 116 to incorporate the limitation of Claim 122, namely that the phosphor particles have a level of impurities that is not greater than about 0.1 atomic percent. Claim 122 has been cancelled.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Applicants submit that Nishisu et al. does not disclose or suggest  $Y_2O_3$  powder batches having a purity of greater than 0.1 atomic percent.

With respect to dependent Claim 122, the Examiner states that the precipitation and calcination process taught by Nishisu et al. is "known to produce high purity particles" and one of ordinary skill in the art would expect this resulting high purity to overlap the claimed range. Applicants respectfully disagree. Indeed, precipitation and calcination processes typically produce particles having a reasonably high degree of impurities. This is evidenced by Nishisu et al. throughout the disclosure. Nishisu et al. clearly recognize that the precipitation process forms  $\text{YOHCO}_3$  and  $\text{EuOHCO}_3$  particles having undesirable impurities. This is evidenced by the steps that Nishisu et al. utilize to attempt to remove some of these impurities. For example, it is disclosed that the precipitates are separated by solid-liquid separation methods and washed several times with water. The particles are then dispersed in an organic solvent such as an alcohol, followed by further solid-liquid separation "to substitute the organic solvent for the impregnated water" (Col. 2, line 68 to Col. 3, line 1). The particles are thereafter calcined at a temperature of at least  $600^\circ\text{C}$  to form spheres of yttrium and europium oxide. Thus, the particles are impregnated with an organic solvent prior to calcination. It is well known that calcination of such impregnated organics typically results in organic residue (e.g., carbon residue) in the final product. Therefore, it is respectfully submitted that the process of Nishisu et al. does not produce high purity particles having not greater than 0.1 atomic percent impurities.

Further, it is well known that even trace amounts of impurities can negatively affect the luminescence properties of such phosphor materials. Therefore, removal of this rejection is respectfully requested.

In addition, Claim 117, has been rewritten as new independent Claim 125 and Claims 126-129 depend on Claim 125. It is respectfully submitted that these claims are also allowable over the prior art of record.

The Examiner has provisionally rejected Claims 116-121 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 62, 63, 66, 76-80 and 88 of copending Application No. 10/730,756. The Examiner states that although the conflicting claims are not identical, they are not patentably distinct from each other because Application No. 10/730,756 teaches devices which contain europium doped  $\text{Y}_2\text{O}_3$  particles have an average particle size in the range of 0.1-10 microns, preferably 0.3-5 microns, are substantially spherical, have the claimed crystallite size and where at least 80%, preferably 90% of the particles have a size that is not larger than 2 times the average particle size. The Examiner states that this is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The Examiner has also rejected Claims 116-121 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 28-30 of U.S. Patent No. 6,180,029 by Hampden-Smith et al. The Examiner states that although the

conflicting claims are not identical, they are not patentably distinct from each other because claims 28-30 teach a powder batch comprising substantially spherical  $Y_2O_3$  phosphor particle, which can comprise europium as a dopant. The Examiner also states that the particles have an average particle size in the range 0.3-5 microns, have the claimed crystallite size and at least 90% of the particles have a size that is not larger than 2 times the average particle size.

The Examiner has also rejected Claims 116-120 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 19 and 23 of U.S. Patent No. 6,197,218. The Examiner states that although the conflicting claims are not identical, they are not patentably distinct from each other because claims 19 and 23 teach a lighting element comprising substantially spherical europium  $Y_2O_3$  phosphor particles having an average particle size in the range 0.3 to 5 microns, have the claimed crystallite size and at least 80% of the particles have a size that is not larger than 2 times the average particle size.


Applicants request that the foregoing obviousness-type rejections be held in abeyance until otherwise patentable subject matter has been determined.

It is not believed that any additional fees are owed with respect to this response, however any such fees can be charged to Deposit Account No. 50-1419.

Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecute and or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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